

Scarus obishime, a New Parrotfish (Perciformes: Scaridae) from the Ogasawara Islands

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Abstract *Scarus obishime* is described as a new species of parrotfish from the Ogasawara Islands from five specimens. It is characterized as follows: 6–7 median predorsal scales, a single scale in third row on cheek, 15 pectoral rays, terminal male with a prominent bulging snout and forehead; initial-phase fish yellowish brown with an irregular white lateral stripe posteriorly on body; terminal male deep blue with a broad yellow bar on body.

While conducting field work on fishes in the Ogasawara Islands (formerly known as the Bonin Islands) in July 1990, the authors observed a parrotfish that they had never seen before. It was yellowish brown with an irregular chalky white lateral stripe on the middle and posterior part of the body (Fig. 1, top). Our first specimen was collected on July 12 off the south shore of Ani-jima on reef in 3.5 m. Three more were collected in Miyanohama, Chichi-jima on July 15 (Fig. 1, bottom).

Ascending from a deep dive off the east coast of Ani-jima, the senior author observed a very large, deep-bodied, dark blue parrotfish with a broad yellow bar on the body and a prominent bulbous forehead. Later the junior author observed and photographed it at closer range in 37 m off Miyanohama, Chichi-jima (Fig. 2, top). At the time we did not suspect that two such different fishes could be the same species. Subsequently, however, we observed and photographed large ones in the yellowish brown phase which had become more brown overall with a broad bar of brownish yellow developing below the spinous portion of the dorsal fin; also the dorsal profile of the head was steeper (Fig. 2, middle). It had become obvious that the large blue and yellow fish is the terminal male of the yellowish brown form.

A major effort was then made to try to collect the large male. The senior author struck one with a spear, but it escaped. After our departure from the islands, Johnson Kimura of the Ogasawara Fisheries Center collected a large specimen, which was photographed for us in color by Kenji Kato (Fig. 2, bottom). The purpose of the present paper is to describe this species.

Material and Methods

Standard length (SL) is measured from the most anterior median point of the upper dental plate (even though the forehead of the terminal male may be more anterior) to the base of the caudal fin (end of hypural plate). Head length and snout length are taken from the same anterior point, the former to the posterior end of the opercular flap, and the latter to the fleshy edge of the orbit. Body depth is the greatest depth from the base of the dorsal spines, and body width the maximum width immediately posterior to the gill opening. Orbit diameter is the greatest fleshy diameter, and interorbital width the least fleshy width. Caudal peduncle depth is the least depth, and caudal peduncle length the horizontal distance from a vertical at the rear base of anal fin to the caudal-fin base. Fin spine lengths are taken from the extreme base of the spines to the fleshy tips (since the spines are not pungent, it is difficult to measure to the spine tips without dissection or radiograph). Caudal concavity is the horizontal distance between verticals at the tips of the longest and shortest caudal rays (this measurement needed only for the terminal male holotype).

Pectoral ray counts include the upper rudimentary ray. Counts of the three rows of scales on the cheek are made as indicated in fig. 5 of Schultz (1958). Row 1 is the first diagonal row of scales beneath the eye, the last scale ending behind the lower half of the eye; the last scale of row 2 does not extend above the lower edge of the eye; row 3 in this species consists of a single scale on the membranous ventral flange of the preopercle. Gill-raker counts were made only on



Fig. 1. Top: *Scarus obishime* sp. nov., initial phase, about 300 mm TL, Ani-jima, Ogasawara Islands (J. Randall). Bottom: paratype of *Scarus obishime* sp. nov., initial phase, BPBM 35093, 264 mm SL, Miyanohama, Chichi-jima, Ogasawara Islands (J. Randall).

the paratypes.

The abbreviation TP is used for terminal-phase male fish, and IP for the initial-phase. Data presented in parentheses refer to paratypes.

Scarus obishime sp. nov.
(Japanese name: Obishime)
(Figs. 1, 2, Table 1)

Holotype. NSMT-P 35477, TP male, 610 mm SL, Ogasawara Islands, Chichi-jima, east coast, Tatsumi-wan, off

West Beach, rocky bottom in 15 m, spear, Johnson Kimura, 27 July 1990.

Paratypes. BPBM 35075, IP female, 231 mm SL, Ogasawara Islands, Ani-jima, south side at Shirohama ($27^{\circ}06.3'N$, $142^{\circ}12.8'E$); rocky shore with coral cover, 3.5 m, spear, John E. Randall, 12 July 1990; NSMT-P 35478, IP male, 265 mm SL; BPBM 35093, IP female, 264 mm SL; USNM 323664, IP female, 248 mm SL—all from Chichi-jima, Miyanohama, reef in 3–12 m, spear, John E. Randall, 15 July 1990.

Diagnosis. Pectoral rays 15; median predorsal

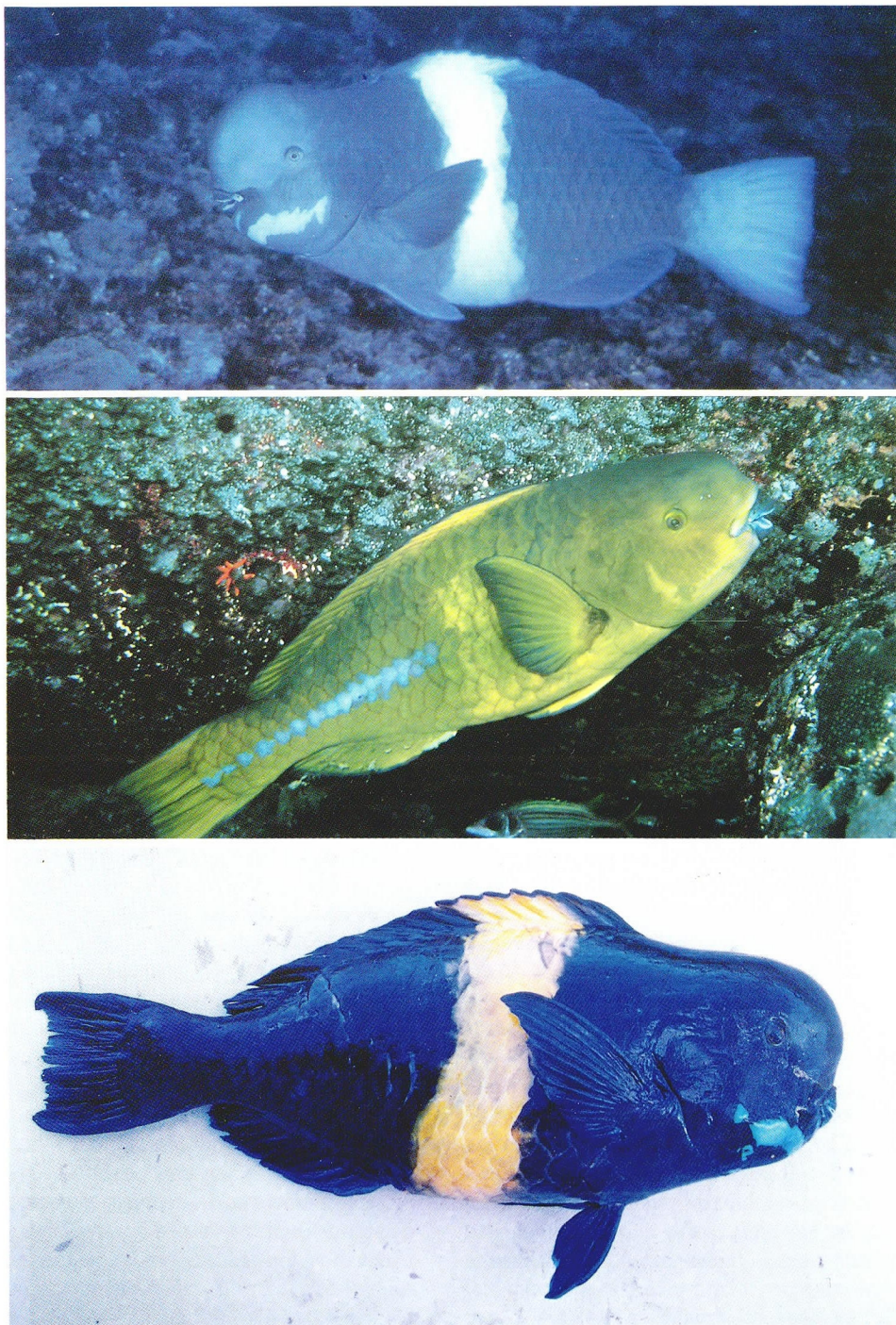


Fig. 2. Top: *Scarus obishime* sp. nov., terminal male, about 700 mm TL, Chichi-jima, Ogasawara Islands (J. Earle). Middle: *S. obishime* sp. nov., initial phase, about 500 mm TL, Higashi-jima, Ogasawara Islands (J. Randall). Bottom: holotype of *S. obishime* sp. nov., terminal male, NSMT-P 35477, 610 mm SL, Tatsumi-wan, Chichijima, Ogasawara Islands (K. Kato).

scales 6 or 7; rows of scales on cheek 3, the first row with 6 or 7 (usually 6) scales, the second with 6 or 7 scales, and the third with 1; body depth of IP fish 2.6–2.9 in SL, of large TP male 2.35 in SL; snout and forehead of TP male bulbous, extending slightly anterior to mouth; head of IP fish bullet-shaped; dental plates blue-green, those of IP fish more than half covered by lips, of TP male fully exposed; caudal fin of IP slightly rounded to truncate, of TP male slightly double emarginate. IP fish brownish yellow to yellowish brown with an irregular white lateral stripe posteriorly on body; TP male deep blue with a broad, slightly oblique, yellow bar in middle of standard length.

Description. Dorsal rays IX, 10, all rays branched, the last to base; anal rays III, 9 (first spine very small and slender), all rays branched, the last to base; pectoral rays 15, the first rudimentary, the second simple; pelvic rays I, 5; principal caudal rays 13, the upper and lower simple; upper procurent caudal rays 5; lower procurent caudal rays 5 (5–6); longitudinal scale series 23; lateral-line interrupted, the dorsoanterior part with 18 (17–20) scales, the peduncular portion with 5 (4–5) (two paratypes with 17–18 scales in dorsoanterior series have an intermediate row of three pored scales above the anterior peduncular part); lateral-line continuing as two pored scales on caudal-fin base, the most posterior enlarged; scales above lateral line to origin of dorsal fin 1.5; scales below lateral line to origin of anal fin 6; median predorsal scales 7 (6–7), progressively larger from the most anterior to the fourth or fifth, then slightly smaller, the last notched medially in front of first dorsal spine; median prepelvic scales 6; circum-peduncular scales 12; gill rakers very small, 43–48; pseudobranchial filaments 37–39 (counts of two paratypes); branchiostegal rays 5; vertebrae 25.

Body of TP male deep, the depth 2.35 (2.6–2.9 in IP paratypes) in SL; body compressed, the width 2.25 (2.05–2.3) in depth; head length 2.75 (3.0–3.1) in SL; head of TP male with snout and forehead strongly and evenly convex, protruding slightly anterior to mouth (most anterior point in front of eye); head of IP fish smoothly and symmetrically rounded dorsally and ventrally (larger individuals, as seen in Fig. 4, with a steeper snout profile); snout length 2.0 (2.45–2.65) in head; orbit diameter 10.4 (6.4–7.4) in head; eye of TP male only slightly above middle of head; interorbital space strongly convex (extremely so in TP male), the width 2.25 (2.5–2.55) in head; caudal peduncle depth 2.75 (2.1–2.15) in head;

caudal peduncle length of TP male 3.55 in head; peduncle length of IP fish nearly equal to peduncle depth.

Mouth slightly inferior, the gape angling downward about 20° to horizontal axis of head; teeth fully fused to form dental plates, each with a median suture, the upper overlapping the lower; outer surface of dental plates smooth; no canine teeth on side of dental plates; dental plates of TP male fully exposed, with algae growing basally on upper plate; lips cover more than half of dental plates of IP fish; upper pharyngeal bones each with a row of ten ridged molariform teeth which interlock medially; the single lower pharyngeal bone elliptical with a concave surface studded with molariform teeth in ten anterior-posterior rows and a maximum of five transverse rows (pharyngeal plates of 248-mm paratype exposed but not removed).

Nostrils very small, in front of upper half of eye, the posterior nostril of holotype slightly more than an eye diameter in front of edge of orbit (three-fourths eye diameter on paratypes); internarial space about equal to pupil diameter; anterior nostril with a low membranous rim that is slightly elevated dorso-posteriorly (less evident on holotype than paratypes).

Scales large, cycloid, and flexible, those dorsally on head extending slightly anterior to center of eye; scales on cheek and ventrally on head extending only slightly anterior to a vertical at front edge of orbit; dorsal, anal, and pectoral fins naked except for upper part of the small dorsalmost row of scales on body which extends onto base of dorsal fin; caudal fin with two vertical rows of large scales on base which extend half way to posterior edge of fin; pelvic fins with a midventral process of two scales, the more posterior pointed.

Origin of dorsal fin over second lateral-line scale; first dorsal spine 4.55 (2.85–3.6) in head; remaining spines progressively longer, the ninth 3.45 (2.4–2.85); first dorsal ray longest, 3.3 (2.25–2.45) in head; first anal spine very small and slender (not detectable except by dissection or radiograph), about one-third length of second spine; second anal spine about three-fourths length of third spine; third anal spine 4.65 (2.75–3.2) in head; first anal soft ray longest, 2.6 (2.45–3.0) in head; caudal fin of TP male slightly double emarginate, the fin length 1.45 in head, the caudal concavity 8.2 in head; caudal fin of IP fish slightly rounded to truncate, the fin length 1.5–1.55 in head; third pectoral ray longest, 1.4

(1.45–1.5) in head; origin of pelvic fins below lower base of pectoral fins; pelvic fins short, not approaching anus, 2.0 (1.65–1.8) in head.

Color of holotype in alcohol: dark gray with a broad pale yellowish bar extending from posterior half of abdomen to base of third to seventh dorsal spines and continuing into dorsal fin to the narrow dark bluish margin; a narrow irregular transverse white band on chin 4 mm behind lower dental plate, continuing dorsally to within three-fourths eye diameter of rictus; a broad white band from throat next to anterior end of gill opening, curving upward to end on lower flange of preopercle in front of scale of third cheek scale row (this band irregular and broken to two bands on another individual photographed underwater); several small irregular white spots in a transverse row on lower side of head, the first just above scale in third cheek scale row (these small pale spots absent on some TP males viewed underwater); dental plates deep blue-green except for narrow whitish edge and algae basally on upper plate.

Color of holotype when fresh (Fig. 2, bottom):

deep blue with a very broad, slightly diagonal, bright yellow bar from posterior abdomen to dorsal fin; a broad, curved, pale blue-green band from throat to lower part of preopercle; several small, irregular, pale blue-green spots ventrally on head; margin of pelvic and anal fins bright blue. Two large terminal males observed underwater had a white bar edged in yellow on the body instead of solid yellow. As noted in Fig. 2, top, the bulging snout and forehead of the TP male is paler than the rest of the head in life, and the caudal fin pale blue.

Color of paratypes in alcohol: brown, the scales a little darker than centers; margin of dorsal and anal fins dark brown; paired fins pale with brown rays, the pectorals with a darker brown bar at base, this pigmentation continuing into dorsal part of axil; dental plates deep blue-green with the free edge whitish.

Color of small IP adults: yellowish gray, the scales on body with a narrow dark yellow edge; an irregular, lateral white band on body from behind pectoral fin to caudal-fin base; fins dull yellow, all with a narrow blue margin (only on upper edge of pecto-

Table 1. Proportional measurements of type specimens of *Scarus obishime* sp. nov. expressed as a percentage of the standard length

	Holotype	Paratypes			
	NSMT-P 35477	BPBM 35075	USNM 323664	BPBM 35093	NSMT-P 35478
Standard length (mm)	610	231	248	264	265
Body depth	42.7	34.6	35.0	37.2	38.6
Body width	18.8	16.8	17.3	17.4	16.6
Head length	37.5	32.1	32.2	32.2	33.5
Snout length	18.5	12.1	13.1	13.0	13.8
Orbit diameter	3.6	5.0	4.5	4.5	4.5
Interorbital width	16.7	12.7	12.8	12.9	13.2
Caudal peduncle depth	13.6	14.8	15.3	15.1	15.5
Caudal peduncle length	10.5	16.3	15.8	14.7	14.7
Predorsal length	41.1	34.8	34.2	33.6	34.8
Preanal length	72.7	62.4	61.8	66.2	63.5
Prepelvic length	36.8	33.7	33.9	34.2	34.0
Dorsal fin base	58.4	58.7	58.3	59.2	58.5
First dorsal spine	8.2	8.9	9.6	9.5	9.8
Ninth dorsal spine	10.9	11.2	13.3	11.9	12.1
Longest dorsal ray	11.3	13.0	14.2	13.6	13.9
Anal fin base	22.4	24.1	25.4	25.8	25.7
Third anal spine	8.1	11.7	10.9	11.3	11.0
Longest anal ray	14.2	12.1	12.0	13.1	12.1
Caudal fin length	26.2	21.6	21.6	21.2	21.8
Caudal concavity	4.6	—	—	—	—
Pectoral fin length	27.0	21.5	22.2	22.4	23.0
Pelvic spine length	14.9	16.0	16.1	15.7	15.9
Pelvic fin length	18.6	18.0	19.2	18.7	18.8

ral); iris yellow. Larger IP adults become dark yellowish brown, the head dark gray-brown (yellowish brown on scaled parts), the lateral white stripe persisting.

Remarks. This species is known in Chichi-jima as Obishime; we here adopt this Japanese name as the scientific name. It is the word for a colorful sash of traditional costume that Japanese wear around their waists, hence obviously referring to the bright yellow bar of the terminal male of this species.

It seems surprising that such a large species of parrotfish, so distinctive in coloration in both color phases, could be undescribed until now. However, so far as we know, it appears to be endemic to the Ogasawara Islands, which have not been as well collected as other Japanese localities, in general. Furthermore, the species is not common. The TP males of *Scarus obishime* are especially rare; also they are difficult to approach underwater. In three visits of ten days to two weeks to the Chichi-jima group of Ogasawara Islands from 1990–1992, we saw only about a dozen of these large males. Usually they were encountered at depths of 25 m or more; the senior author pursued one, camera in hand, to a depth of over 55 m.

The closest relative of *Scarus obishime* appears to be *S. ovifrons* Temminck and Schlegel, which is known from Okinawa to Indonesia. Like *S. obishime*, it has 15 pectoral rays, 6 median dorsal scales, and a strongly convex forehead in the TP phase, but the head convexity is more acute, with its most anterior point well above the level of the eye. Also it has a canine posteriorly on the side of the upper dental plate, and there is no similarity in color (see illustrations of three phases in Masuda et al., 1984: pl. 216 D–F).

Schultz (1958) proposed the subgenus *Ypsiscarus* for *Scarus oedema* on the basis of the oedemate swelling of its forehead and having 3 median predorsal scales. Schultz (1969) elevated this subgenus to a genus and added *Scarus ovifrons* Temminck and Schlegel (a species he had overlooked in his 1958 review). He erred in stating that *S. ovifrons* has 3 median predorsal scales; it has 6. He could have added a fourth species to *Ypsiscarus*, *Scarus cyaneus* Valenciennes from the western Indian Ocean, as it also has a bulging forehead, as well as 3 median predorsal scales and 15 pectoral rays (see Randall and Bruce, 1983: 13, pl. 1B). The anterior convexity of *S. ovifrons* and *S. cyaneus*, however, is different from that of *S. oedema* and *S. obishime*; it is confined

to the forehead, ending just above the level of the eye, whereas that of *S. oedema* and *S. obishime* involves both the forehead and the snout in a single large protuberance. Randall and Nelson (1979) showed that *Scarus oedema* is related to *S. sordidus* Forsskal and allies, and Randall and Bruce (1983) and subsequent authors have not recognized *Ypsiscarus* as a genus.

In their checklist of fishes from the Ogasawara Islands, Zama and Fujita (1977) included *Scarus oedema* and *S. ovifrons* (as *Ypsiscarus*) from lists of previous Japanese workers. Zama and Fujita had no specimens of either of these species, and we have not observed either in the Ogasawara Islands. It seems likely that these early records of *S. oedema* and *S. ovifrons* were based on specimens or sightings of *S. obishime*.

Like other parrotfishes, *Scarus obishime* grazes heavily on benthic algae during daylight hours. We did not see it feed on live coral.

Acknowledgments

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87-138. (In Japanese.)

小笠原諸島から採集されたブダイ科の1新種

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小笠原諸島から採集された5個体の標本に基づいてブダイ科の新種オビシメを記載した。本種は以下の形質によって識別される。背鰭前鱗数が6-7枚、頬の第3列目の鱗は1枚、胸鰭条数は15本、ターミナルフェイズの雄の吻と前頭部は膨出し、イニシアルフェイズの個体の体色は黄褐色で体側後部に白色線が縦に走り、ターミナルフェイズの雄の体色は青く、鮮黄色の横帯がある。